Waves

8-6 The student will demonstrate an understanding of the properties and behaviors of waves. (Physical Science)

8-6.6 Explain sight in terms of the relationship between the eye and the light waves emitted or reflected by an object.
Taxonomy level: 2.7-B Understand Conceptual Knowledge

Previous/Future knowledge: Students have not been introduced to the concept of the relationship between the eye and light waves in previous grades. They will further develop the concept of light in high school Physical Science (PS-7.6).

It is essential for students to know that the interaction the eye and light emitted or reflected by an object to allow sight to occur as follows:

- Light waves that have been emitted or reflected by an object, enter the eye and first pass through the transparent layer called the *cornea* where they are refracted.
- The light rays are then refracted again as they pass through the transparent *lens* (convex).
- The lens focuses the light waves on the *retina*, located on the back of the inside of the eye.
- The retina is composed of tiny light sensitive nerves that transfer the energy of the light waves to nerve impulses transmitted through the *optic nerve* to the brain for interpretation as *sight*.

It is not essential for students to know about vision problems, such as being nearsighted or farsighted, but these might be interesting topics for discussion.

Assessment Guidelines:
The objective of this indicator is to *explain* sight in terms of the relationship between the eye and the light waves emitted or reflected by an object; therefore, the primary focus of assessment should be to construct a cause-and-effect model of the eye indicating how it interacts with light waves to allow sight to occur. However, appropriate assessments should also require students to *recognize* the functions of the major parts of the eye; *interpret* a diagram of the major parts eye and their functions in transmitting and transferring light to nerve impulses in the brain for sight; *interpret* a diagram showing how light rays travel through the eye; or *summarize* the transfer of light through the major parts of the eye.